



# Polynomials

## Multiplying Polynomials

$$\begin{aligned}(s-2)(s^2-s+3) &= s(s^2-s+3) - 2(s^2-s+3) \\ &= s \cdot s^2 - s \cdot s + s \cdot 3 - 2 \cdot s^2 - 2(-s) - 2 \cdot 3 \\ &= s^3 - s^2 + 3s - 2s^2 + 2s - 6 \\ &= s^3 - 3s^2 + 5s - 6\end{aligned}$$

1.  $(z-3)(z+3)$

$$z^2 - 9$$

2.  $(3t-2)(t-3)$

$$3t^2 - 9t - 2t + 6$$

$$3t^2 - 11t + 6$$

3.  $(a+5)(a+5)$

$$a^2 + 10a + 25$$

4.  $(a+b)(2x+y)$

$$2ax + ay + 2bx + by$$

5.  $(\frac{1}{2}x - y)(2x + y)$

$$x^2 - 1.5xy - y^2$$

6.  $(x-9)(x-2)$

$$x^2 - 2x - 9x + 18$$

$$x^2 - 11x + 18$$

7.  $(2x+4)(x+3)$

$$2x^2 + 6x + 4x + 12$$

$$2x^2 + 10x + 12$$

8.  $(3x+2)(2x+5)$

$$6x^2 + 15x + 4x + 10$$

$$6x^2 + 19x + 10$$

9.  $(4x-9)(3x+1)$

$$12x^2 + 4x - 27x - 9$$

$$12x^2 - 23x - 9$$

10.  $(h+k)(h^2-2hk+3k^2)$

$$h^3 - 2h^2k + 3hk^2 + h^2k - 2hk^2 + 3k^3$$

$$h^3 - h^2k + hk^2 + 3k^3$$

11.  $(2x-1)(x^2+x+3)$

$$2x^3 + 2x^2 + 6x - x^2 - x - 3$$

$$2x^3 + x^2 + 5x - 3$$

12.  $(x^3+3x^2+2x-1)(x-1)$

$$x^4 + 3x^3 + 2x^2 - x^3 - 3x^2 - 2x + 1$$

$$x^4 + 2x^3 - x^2 - 3x + 1$$

13.  $(n-m)(n^2+m^2)$

$$n^3 + nm^2 - mn^2 - m^3$$

14.  $(y+1)(y^2-2y+2)$

$$y^3 - 2y^2 + 2y + y^2 - 2y + 2$$

$$y^3 - y^2 + 2$$

15.  $(x+2y)(2x+3y)$

$$2x^2 + 3xy + 4xy + 6y^2$$

$$2x^2 + 7xy + 6y^2$$

16.  $(6x-y)(3x-2y)$

$$18x^2 - 12xy - 3xy + 2y^2$$

$$18x^2 - 15xy + 2y^2$$

17.  $(4x+y)(3x-4y)$

$$12x^2 - 16xy + 3xy - 4y^2$$

$$12x^2 - 13xy - 4y^2$$

18.  $(5a+3b)(4a-b)$

$$20a^2 - 5ab + 12ab - 3b^2$$

$$20a^2 + 7ab - 3b^2$$